

REMARKS

In the Final Office Action¹, the Examiner rejected claims 1, 7, 13, and 14 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,463,618 to Furukawa et al. ("Furukawa") in view of allegedly Admitted Prior Art ("APA") and further in view of "Continuous Speech Recognition in Noise Using Spectral Subtraction and HMM Adaptation," 1994 to Flores et al. ("Flores"); rejected claims 2 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Furukawa, APA, and Flores and further in view of U.S. Patent No. 5,475,791 to Schalk ("Schalk"); and rejected claims 4, 5, 10, and 11 under 35 U.S.C. § 103(a) as being unpatentable over Furukawa, Flores, APA, and Schalk, and further in view of "Signal Conditioning Techniques for Robust Speech Recognition," 1996 to Rahim et al. ("Rahim").

By this amendment, Applicants have amended claims 1 and 7. Exemplary support for these amendments can be found in the specification at, for example, page 13, lines 5-19. Claims 1, 2, 4, 5, 7, 8, 10, 11, 13, and 14 remain pending and under current examination.

I. Standard for Obviousness Rejections

On October 10, 2007, the Patent Office published examination guidelines for determining obviousness under 35 U.S.C. § 103 in view of KSR International Co. v. Teleflex Inc., 550 U.S. ___, 82 USPQ2d 1385 (2007), a recent Supreme Court decision. Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc., 72 Fed. Reg.

¹ The Final Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement of characterization in the Final Office Action.

57526 (Oct. 10, 2007). As reiterated by the Supreme Court in KSR, the framework for the objective analysis for determining obviousness under 35 U.S.C. § 103 is stated in Graham v. John Deere Co. Examination Guidelines , 72 Fed. Reg. at 57527.

Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Graham Court are:

- (1) the scope and content of the prior art;
- (2) the differences between the claimed invention and the prior art; and
- (3) the level of ordinary skill in the pertinent art. Id.

The Examination Guidelines explain that, when making an obviousness rejection, an examiner must “ensure that the written record includes findings of fact concerning the state of the art and the teachings of the references applied.” Id. Moreover, in certain circumstances, “it may also be important to include explicit findings as to how a person of ordinary skill would have understood prior art teachings, or what a person of ordinary skill would have known or could have done.” Id. These types of factual findings represent “the necessary underpinnings to establish obviousness.” Id.

II. Rejection of Claims 1, 7, 13, and 14

Applicants respectfully traverse the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Furukawa in view of alleged APA and further in view of Flores. Applicants respectfully submit that Furukawa, alleged APA, and Flores fail to support a rejection of claim 1 under 35 U.S.C. § 103(a).

The alleged APA discloses that it is difficult under the environment of a running car “to determine a unique optimum threshold value for checking the existence of a near-end input because the energy level of the additive noise of an unknown source

greatly varies in a range of 60-80 dBA.” APA, page 13, lines 5-19. The Applicants’ specification, however, describes the previously unrecognized benefits of combining NLMS-VAD methods with continuous spectrum subtraction (CSS) technology for increasing speech recognition accuracy in the environment of a running car. See Specification, page 11, line 11 to page 12, line 11 and page 22, lines 12-17. CSS technology is known to be useful in lessening the effects of noise components from unknown sources. The Applicants, unlike the prior art, recognized that combining NLMS-VAD methods with CSS processing can suppress acoustic echo (unsteady additive noise) not cancelled by NLMS-VAD method alone.

Significantly, the applied references fail to disclose how to combine these two technologies to achieve the results of the present invention. In this regard, claim 1 requires:

control means for, in a frame for which the result of decision made by said decision means is negative, storing in said storage means the current impulse response held by said supply means and, in a frame for which the result of the decision is positive, retrieving one of the impulse responses stored in said storage means and supplying the one of the impulse responses to said supply means.

As noted on page 53, lines 11-26, of the specification, the impulse response is updated in the normal manner only when a voice decision flag 18 is OFF. When voice is detected, a previously stored impulse response is used.

This method of combining the two known technologies is not taught or rendered obvious from any of the art of record.

The Applicants, unlike Furukawa, realized the beneficial effects of combining the CSS and NLMS-VAD methods, as claimed. Figure 10 of the application, for example, shows an exemplary spectrogram obtained by applying CSS processing to a signal with acoustic echo cancelled using NLMS-VAD processing. As illustrated, for example, in Figure 10B, the CSS method cancels the remaining acoustic echo components from the signal. The Applicants in this application, unlike Furukawa, discovered that combining the CSS method and the NLMS-VAD method as claimed enables the suppression of echo remaining from the use of the NLMS-VAD method alone.

In light of the arguments above, Applicants respectfully submit that Furukawa, the alleged APA, and Flores fail to support a rejection of claim 1 under 35 U.S.C. § 103(a) and that the Examiner has failed to provide a proper motivation for combining these references.

Claim 7, although of different scope than claim 1, recites similar features to those of claim 1. Moreover, since there is no disclosure in the applied references of how to combine the two technologies, Applicants also request reconsideration of claims 13 and 14, which require this combination. Accordingly, for at least the reasons discussed above with regard to claim 1, Furukawa, the alleged APA, and Flores taken alone or in combination, cannot support a *prima facie* case of obviousness for claims 7, 13 and 14. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claims 7, 13 and 14 under 35 § U.S.C. § 103(a) and allow these claims.

III. Rejection of Claims 2 and 8

Applicants respectfully traverse the rejection of claims 2 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Furukawa, alleged APA, Flores, and further in view of Schalk. Claims 2 and 8 depend from independent claims 1 and 7, respectively, and thus include all the recitations of their respective independent claims. Accordingly, for at least the reasons provided for claims 1 and 7, Furukawa, alleged APA, and Flores do not teach or suggest the above-noted features of claims 2 and 8.

The Examiner relies on Schalk for allegedly disclosing the use of an echo-cancelled signal for speech recognition. See Office Action, page 5. Schalk does not, however, teach or suggest control means that, in a frame for which the result of decision made by said decision means is negative, store the current impulse response held by said supply means and, in a frame for which the result of the decision is positive, retrieve one of the impulse responses stored in a storage means, as required by claim 1. Schalk also fails to describe or suggest the control step recited in claim 7. Schalk, therefore, fails to overcome the above-noted deficiencies of Furukawa, alleged APA, and Flores. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claims 2 and 8 under 35 U.S.C. § 103(a) and allow these claims.

IV. Rejection of Claims 4, 5, 10, and 11

Applicants respectfully traverse the rejection of claims 4, 5, 10, and 11 under 35 U.S.C. § 103(a) as being unpatentable over Furukawa, alleged APA, Flores, Schalk and further in view of Rahim.

As noted above, Furukawa, alleged APA, Schalk, and Flores, either taken alone or in combination, do not disclose or suggest the above-noted features of claims 1 and

7, from which claims 4, 5, 10, and 11 depend. The Examiner cited Rahim as disclosing various other elements. See Office Action, pages 5-6. Even assuming this characterization of Rahim is correct, which Applicants do not concede, Rahim fails to cure the deficiencies of Furukawa, alleged APA, Flores, and Schalk as discussed above.

Thus, Furukawa, alleged APA, Flores, Schalk and Rahim taken alone or in combination, do not teach or suggest all elements recited in independent claims 1 and 7 and required by dependent claims 4, 5, 10, and 11. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claims 4, 5, 10, and 11 under 35 U.S.C. § 103(a) and allow these claims.

V. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

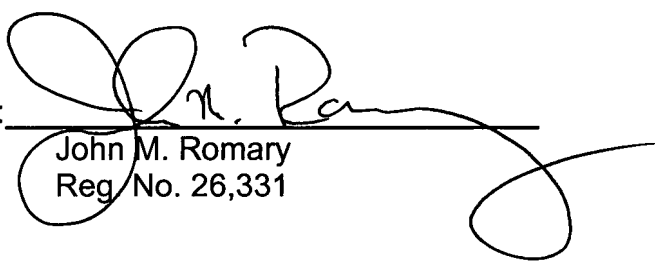
Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: October 18, 2007

By: _____


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